SF/AR
6.9.2.1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101
10 July 1999

Reply to
Attn of: OEA-095

Subject: QA Comments on Bunker Hill Mine Water Treatability Study Work Plan

From: Bruce A. Woods, Ph.D.
QA Unit, Chemist, CLP TPO

To: Mary Kay Voytilla
Superfund Program

The Quality Assurance Unit has completed its review of the document entitled, *Bunker Hill Mine Water Treatability Study Work Plan, Bunker Hill Mine, Kellogg, Idaho*. This document was prepared by Ch2M Hill and is dated June 1999. The following comments are offered:

1. In the plan they propose using ICP/MS for the analyses of the toxic metals listed in Table 1-1, in order to obtain lower quantitation limits. This is an acceptable proposal, but I am uncertain what the total dissolved solids content may be of the final treated effluent from the study. If dissolved solids exceed about 0.5 g/l, then this may cause problems with the ICP/MS analyses of these samples. We may not know if this is a problem until they complete some of the proposed treatability option tests.

2. On p. 3-2, under Section 3.1, second paragraph and throughout the studies, there are a number of places where they state they are going to analyze treated samples for a limited number of metal, i.e., the pH adjusted CTP effluent samples. In thinking about this, the proposed methods of analyses, ICP and ICP/MS for metals, can measure most all of the metals with very little additional instrument time or effort. While most of the concern is to reduce the toxic metals in the acid mine drainage, information on the other metals may be useful, for troubleshooting actual treatment plant operations, etc.

3. On p. 3-2, Section 3.2 Iron Co-Precipitation Testing, the proposed protocol utilizes a single parameter change protocol and assumes that the optimization of one operating parameter, such as pH, and then sequential optimization of the second operating parameter, such as iron added, will provide information on the optimal operation of the treatability option. This may not be correct, use of simplex optimization methods may be able to provide a better optimum for the operating parameters of pH and iron added. Use of such procedures may actually take fewer tests to determine the optimal conditions for

the treatability test. This comment may also apply to some of the other treatability study options in this plan.

4. On p. 3-8, Section 3.4 Sulfide Functional Ion Exchange Testing, I think this section of the proposed treatability plan needs to be reworked. I am not familiar with treatment systems that add ion exchange resins to the treatment tanks and allow them to sit, as is proposed in this plan. The situations I am familiar with that use ion exchange resins are flow through systems, that utilize the ion exchange resins in a column. If the proposed treatment plant that will be designed based upon the outcome of this treatability study will have ion exchange resin columns, then the treatability study should be conducted using the ion exchange resin in columns also. Batch testing with ion exchange resins as proposed in this study may not yield the same results as might be obtained by using the ion exchange resin in a column.

5. On p. 3-10, Section 3.4.3 Loading/Regeneration Test Procedure (Ion Exchange Testing Phase1b), should probably be re-written to reflect the use of the ion exchange resins in columns rather than a static batch mode, as is proposed in the study. See related comment 4 above.

6. On p. 4-3, third bullet, it is stated in the plan that sample containers will be pre-cleaned by acid soaking in nitric acid. We should save our time and effort and purchase pre-cleaned and analyzed sample containers on the commercial market. The protocol we have specified to all agency contractors is that sample containers are to be both pre-cleaned and analyzed (i.e., have a certificate of analysis showing the containers are clean).

7. On p. 4-3 et seq., they have listed the analyses to be performed on the various test solutions that will be generated for all the various options in this study. I am concerned that for most of the final test solutions they have only identified the three toxic metals (Cd, Pb, Zn) for analyses at the conclusion of the study. I would recommend we analyze for all the typical TAL metals. This information may be useful for troubleshooting the treatment plant when it is constructed. Also the proposed treatment options may effect some of the other metals that are present in the waste stream but are not as much of a concern as the previously listed toxic metals. However, the other metals may have impacts on the quantity of chemicals used for treatment, how often resins may have to be regenerated, etc.

8. On p. 4-5, explain the meaning of the last sentence on the page about unused sample liquid will be poured into the KT flume ditch ro manhole to the treatment plant. This sentence does not make sense if the sample are being collected and then shipped to the Ch2M Hill lab in Corvalis, OR. Explain how left over samples, etc., will be properly characterized and disposed of, once the treatability studies are completed at the Ch2H Hill lab.

9. In Table 5-3, they have not specified an analytical method for the analyses of mercury. This should be specified.

10. On p. 5-6, Section 5.4 under Laboratory Quality Control Procedures, fifth bullet and last bullet on p. 5-7, it is stated in the plan that documentation will be equivalent to EPA Contract Laboratory Program (CLP) QC Summary forms. If this laboratory data is to be validated, the CLP QC Summary forms are not enough information to allow the data to be validated. If the data is to be validated, then all raw laboratory documentation will be required, in other words a complete CLP documentation package.

11. On p. 9-1, this section does not make sense. It is stated in the plan that the wastes generated during this study will be compared to the CH2M Hill laboratory Waste Management Plan threshold values and if it is determined the wastes are dischargeable, the wastes will be returned to the Bunker Hill site. Why return such wastes to the site and not discharge at the laboratory, if that is acceptable. My concern would be for wastes they determine cannot be discharged. How will wastes that cannot be discharged be handled?

If you wish to discuss these comments please feel free to contact me at 206 553-1193.